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Good morning Chairman Meehan, Ranking Member Clarke, and distinguished Members of the Subcommittee. Thank you for the opportunity to testify here at Drexel University on the risks and challenges the Nation faces from cyber crime and the importance of partnering with the private sector to address these challenges. Based on the United States Secret Service's (Secret Service) three decades of experience investigating cyber crime and the understanding we have developed regarding the modern transnational organized cyber crime threat to our nation, I hope to provide this subcommittee useful insight into these issue from a federal law enforcement perspective.

The Role of the Secret Service

The Secret Service was founded in 1865 to protect the U.S. financial system from the counterfeiting of our national currency. As the Nation's financial system evolved from paper to plastic to electronic transactions, so too has the Secret Service's investigative mission. Today, our modern financial system depends heavily on information technology for convenience and efficiency. Accordingly, criminals have adapted their methods and are increasingly using cyberspace to exploit our Nation's financial payment system by engaging in fraud and other illicit activities. This is not a new trend; criminals have been committing cyber financial crimes since at least 1970.[1]

Congress promulgated 18 USC §§ 10291030 as part of enacting the Comprehensive Crime Control Act of 1984. Those subsections explicitly assigned the Secret Service authority to investigate these criminal violations.[2] They first established as specific Federal crimes unauthorized access to computers[3] and the fraudulent use, or trafficking of, access devices[4]— defined as any piece of information or tangible item that is a means of account access that can be used to obtain money, goods, services, or other thing of value.[5]

Secret Service investigations have resulted in the arrest and successful prosecution of cyber criminals involved in the largest known data breaches, including those of TJ Maxx, Dave & Buster's, Heartland Payment Systems, and others. Over the past four years Secret Service cyber crime investigations have resulted in over 4,900 arrests, associated with approximately $1.37 billion in fraud losses and the prevention of over $11.24 billion in potential fraud losses, with a 99.5% conviction rate in cases that go to trial. Through our work with our partners at the Department of Justice (DOJ), in particular the local U.S. Attorney Offices, the Computer Crime and Intellectual Property Section (CCIPS), the International Organized Crime Intelligence and Operations Center (IOC-2), and others, we are confident we will continue to bring the cyber criminals that perpetrate major data breaches to justice.

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[1] Beginning in 1970, and over the course of three years, the chief teller at the Park Avenue branch of New York's Union Dime Savings Bank manipulated the account information on the bank's computer system to embezzle over $1.5 million from hundreds of customer accounts. This early example of cyber crime not only illustrates the long history of cyber crime, but the difficulty companies have in identifying and stopping cyber criminals in a timely manner—a trend that continues today.
[2] *See* 18 USC § 1029(d) & 1030(d)(1)
[3] *See* 18 USC § 1030
[4] *See* 18 USC § 1029
[5] *See* 18 USC § 1029(e)(1)

The Transnational Cyber Crime Threat

Advances in computer technology and greater access to personally identifiable information (PII) via the Internet have created online marketplaces for transnational cyber criminals to share stolen information and criminal methodologies. As a result, the Secret Service has observed a marked increase in the quality, quantity, and complexity of cyber crimes targeting private industry and critical infrastructure. These crimes include network intrusions, hacking attacks, malicious software, and account takeovers leading to significant data breaches affecting every sector of the world economy. The recently reported data breaches of Target and Neiman Marcus are just the most recent, well-publicized examples of this decade-long trend of major data breaches perpetrated by cyber criminals who are intent on targeting our Nation's retailers and financial payment systems.

The increasing level of collaboration among cyber-criminals allows them to compartmentalize their operations, greatly increasing the sophistication of their criminal endeavors as they develop expert specialization. These specialties raise both the complexity of investigating these cases, as well as the level of potential harm to companies and individuals. For example, illicit underground cyber crime marketplaces allow criminals to buy, sell and trade malicious software, access to sensitive networks, spamming services, payment card data, PII, bank account information, brokerage account information, hacking services, and counterfeit identity documents. These illicit digital marketplaces vary in size, with some of the more popular sites boasting membership of approximately 80,000 users. These digital marketplaces often use various digital currencies, and cyber criminals have made extensive use of digital currencies to pay for criminal goods and services or launder illicit proceeds.

The Secret Service has successfully investigated many underground cyber criminal marketplaces. In one such infiltration, the Secret Service initiated and conducted a three-year investigation that led to the indictment of 11 perpetrators allegedly involved in hacking nine major U.S. retailers and the theft and sale of more than 40 million credit and debit card numbers. The investigation revealed that defendants from the United States, Estonia, China and Belarus successfully obtained credit and debit card numbers by hacking into the wireless computer networks of major retailers — including TJ Maxx, BJ's Wholesale Club, Office Max, Boston Market, Barnes & Noble, Sports Authority and Dave & Buster's. Once inside the networks, these cyber criminals installed "sniffer" programs[6] that would capture card numbers, as well as password and account information, as they moved through the retailers' credit and debit processing networks. After the data was collected, the conspirators concealed the information in encrypted computer servers that they controlled in the United States and Eastern Europe. The credit and debit card numbers were then sold through online transactions to other criminals in the United States and Eastern Europe. The stolen numbers were "cashed out" by encoding card numbers on the magnetic strips of blank cards. The defendants then used these fraudulent cards to withdraw tens of thousands of dollars at a time from ATMs. The defendants were able to conceal and launder their illegal proceeds by using anonymous Internet-based

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[6] Sniffers are programs that detect particular information transiting computer networks, and can be used by criminals to acquire sensitive information from computer systems.

digital currencies within the United States and abroad, and by channeling funds through bank accounts in Eastern Europe.[7]

In data breaches like these the effects of the criminal acts extended well beyond the companies compromised, potentially affecting millions of individual card holders. Proactive and swift law enforcement action protects consumers by preventing and limiting the fraudulent use of payment card data, identity theft, or both. Cyber crime directly impacts the U.S. economy by requiring additional investment in implementing enhanced security measures, inflicting reputational damage on U.S. firms, and direct financial losses from fraud—all costs that are ultimately passed on to consumers.

Secret Service Strategy for Combating this Threat

The Secret Service proactively investigates cyber crime using a variety of investigative means to infiltrate these transnational cyber criminal groups. As a result of these proactive investigations, the Secret Service is often the first to learn of planned or ongoing data breaches and is quick to notify financial institutions and the victim companies with actionable information to mitigate the damage from the data breach and terminate the criminal's unauthorized access to their networks. One of the most poorly understood facts regarding data breaches is that it is rarely the victim company that first discovers the criminal's unauthorized access to their network; rather it is law enforcement, financial institutions, or other third parties that identify and notify the likely victim company of the data breach by identifying the common point of origin of the sensitive data being trafficked in cyber crime marketplaces.

A trusted relationship with the victim is essential for confirming the crime, remediating the situation, beginning a criminal investigation, and collecting evidence. The Secret Service's global network of field offices, including our 35 Electronic Crimes Task Forces (ECTFs), are essential for building and maintaining these trusted relationships, along with the Secret Service's commitment to protecting victims' privacy and the confidentiality of their information.

When the Secret Service identifies a potential network intrusion, the Secret Service contacts the owner of the suspected compromised computer systems in order to assess the data breach and to stop the continued theft of sensitive information and the exploitation of a network. Once the victim of a data breach confirms that unauthorized access to their networks has occurred, the Secret Service works with the local U.S. Attorney's office, or appropriate state and local officials, to begin a criminal investigation of the potential violation of 18 USC § 1030. During the course of this criminal investigation, the Secret Service identifies the malware and means of access used to acquire data from the victim's computer network. In order to enable other companies to mitigate their cyber risk based on current cyber crime methods, we quickly share information concerning the cybersecurity incident with the widest audience possible, while protecting grand jury information, the integrity of ongoing criminal investigations, and the victims' privacy and confidentiality. We share this cybersecurity information through:

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[7] Additional information on the criminal use of digital currencies can be referenced in testimony provided by U.S. Secret Service Special Agent in Charge Edward Lowery before the Senate Homeland Security and Governmental Affairs Committee in a hearing titled, "Beyond Silk Road: Potential Risks, Threats, and Promises of Virtual Currencies" (November 18, 2013).

- ➢ Our Department's National Cybersecurity & Communications Integration Center (NCCIC);
- ➢ The Information Sharing and Analysis Centers (ISAC);
- ➢ Our ECTFs;
- ➢ The publication of joint industry notices;
- ➢ Our numerous partnerships developed over the past three decades in investigating cyber crimes; and,
- ➢ Contributions to leading industry and academic reports like the Verizon Data Breach Investigations Report, the Trustwave Global Security Report, and the Carnegie Mellon CERT Insider Threat Study.

As we share cybersecurity information discovered in the course of our criminal investigation, we also continue our investigation in order to apprehend and bring to justice those involved. Due to the inherent challenges in investigating transnational crime, particularly the lack of cooperation of some countries with law enforcement investigations, occasionally it takes years to finally apprehend the top tier criminals responsible. For example, Dmitriy Smilianets and Vladimir Drinkman were arrested in June 2012, as part of a multi-year investigation by the Secret Service, while they were traveling in the Netherlands thanks to the assistance of Dutch law enforcement. The alleged total fraud loss from their cyber crimes exceeds $105 million.

As a part of our cyber crime investigations, the Secret Service also targets individuals who operate illicit infrastructure that supports the transnational organized cyber criminal. For example, in May 2013 the Secret Service, as part of a joint investigation through the Global Illicit Financial Team, shut down the digital currency provider Liberty Reserve. Liberty Reserve is alleged to have had more than one million users worldwide and to have laundered more than $6 billion in criminal proceeds. This case is believed to be the largest money laundering case ever prosecuted in the United States and is being jointly prosecuted by the U.S. Attorney's Office for the Southern District of New York and DOJ's Asset Forfeiture and Money Laundering Section. In a coordinated action with the Department of the Treasury, Liberty Reserve was identified as a financial institution of primary money laundering concern under Section 311 of the USA PATRIOT Act, effectively cutting it off from the U.S. financial system.

Collaboration with Other Federal Agencies and International Law Enforcement

While cyber-criminals operate in a world without borders, the law enforcement community does not. The increasingly multi-national, multi-jurisdictional nature of cyber crime cases has increased the time and resources needed for successful investigation and adjudication. The partnerships developed through our ECTFs, the support provided by our Criminal Investigative Division, the liaison established by our overseas offices, and the training provided to our special agents via Electronic Crimes Special Agent Program are all instrumental to the Secret Service's successful network intrusion investigations.

One example of the Secret Service's success in these investigations is the case involving Heartland Payment Systems. As described in the August 2009 indictment, a transnational organized criminal group allegedly used various network intrusion techniques to breach security and navigate the credit card processing environment. Once inside the networks, they installed "sniffer" programs to capture card numbers, as well as password and account information. The

Secret Service investigation, the largest and most complex data breach investigation ever prosecuted in the United States, revealed that data from more than 130 million credit card accounts were at risk of being compromised and exfiltrated to a command and control server operated by an international group directly related to other ongoing Secret Service investigations. During the course of the investigation, the Secret Service uncovered that this international group committed other intrusions into multiple corporate networks to steal credit and debit card data. The Secret Service relied on various investigative methods, including subpoenas, search warrants, and Mutual Legal Assistance Treaty (MLAT) requests to identify three main suspects. As a result of the investigation, these primary suspects were indicted for various computer-related crimes. The lead defendant in the indictment pled guilty and was sentenced to twenty years in federal prison. This investigation is ongoing with over 100 additional victim companies identified.

Recognizing these complexities, several federal agencies are collaborating to investigate cases and identify proactive strategies. Greater collaboration within the federal, state and local law enforcement community enhances information sharing, promotes efficiency in investigations, and facilitates efforts to de-conflict in cases of concurrent jurisdiction. For example, the Secret Service has collaborated extensively with DOJ's CCIPS, which "prevents, investigates, and prosecutes computer crimes by working with other government agencies, the private sector, academic institutions, and foreign counterparts."[8] The Secret Service's ECTFs are a natural complement to CCIPS, resulting in an excellent partnership over the years. In the last decade, nearly every major cyber investigation conducted by the Secret Service has benefited from CCIPS contributions.

The Secret Service also partners with numerous international law enforcement agencies, including the FBI. For example, in August 2010, a joint operation yielded the seizure of 143 computer systems – one of the largest international seizures of digital media obtained by U.S. law enforcement – consisting of 85 terabytes of data, which was transferred to law enforcement authorities in the United States. The data was seized from a criminal Internet service provider located in Odessa, Ukraine, also referred to as a "Bullet Proof Hoster."

The case of Vladislav Horohorin is another example of successful cooperation between the Secret Service and its law enforcement partners around the world. Mr. Horohorin, one of the world's most notorious traffickers of stolen financial information, was arrested while traveling in France on August 25, 2010, pursuant to a request for his provisional arrest with a view toward extradition to the United States. Mr. Horohorin created the first fully-automated online store which held stolen credit card data for sale. Both CCIPS and the Office of International Affairs at DOJ played critical roles in this apprehension.

Apprehending transnational cyber criminals like these is made possible by the Secret Service's 24 international field offices developing close partnerships with numerous foreign law enforcement agencies in order to combat transnational crime. To strengthen our ability to investigate transnational cyber crime, the Secret Service maintains ECTFs in London and Rome, has assigned agents to INTERPOL and EUROPOL, and operates cyber crime working groups in

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[8] U.S. Department of Justice. (n.d.). *Computer Crime & Intellectual Property Section: About CCIPS.* Retrieved from http://www.justice.gov/criminal/cybercrime/

the Netherlands, Estonia, Lithuania, Latvia, Ukraine, and Germany. The Secret Service also trains numerous international partners on investigating cyber crime; in the past three years the Secret Service has trained over 500 law enforcement officials representing over 90 countries in investigating cyber crimes.

The Secret Service investigations of transnational crime are facilitated by the dedicated efforts of both the Department of State and the DOJ's Office of International Affairs to execute MLATs and other forms of international law enforcement cooperation, in addition to the personal relationships that develop between Secret Service agents and their foreign counterparts through these working groups and training efforts.

Within DHS, the Secret Service benefits from a close relationship with Immigration and Customs Enforcement's Homeland Security Investigations (ICE-HSI). Since 1997, the Secret Service, ICE-HSI, and IRS-CI have jointly trained on computer investigations through the Electronic Crimes Special Agent Program (ECSAP). ICE-HSI is also a member of Secret Service ECTFs, and ICE-HSI and the Secret Service have partnered on numerous cyber crime investigations including the recent take down of the digital currency Liberty Reserve.

To further its cybersecurity information sharing efforts, the Secret Service has strengthened its relationship with the National Protection and Programs Directorate (NPPD), including the NCCIC. As the Secret Service identifies malware, suspicious IPs and other information through its criminal investigations, it shares information with our Department's NCCIC. The Secret Service continues to build upon its full-time presence at NCCIC to coordinate its cyber programs with other federal agencies.

As a part of these efforts, and to ensure that information is shared in a timely and effective manner, the Secret Service has personnel assigned to the following DHS and non-DHS entities:

- NPPD's National Cybersecurity & Communications Integration Center (NCCIC);
- NPPD's Office of Infrastructure Protection;
- DHS's Science and Technology Directorate (S&T);
- The National Cyber Investigative Joint Task Force (NCIJTF);
- Each FBI Joint Terrorism Task Force (JTTF), including the National JTTF;
- Department of the Treasury - Office of Terrorist Financing and Financial Crimes (TFFC);
- Department of the Treasury - Financial Crimes Enforcement Network (FinCEN);
- Central Intelligence Agency;
- DOJ's International Organized Crime and Intelligence Operations Center (IOC-2);
- Drug Enforcement Administration's Special Operations Division;
- EUROPOL; and
- INTERPOL.

The Secret Service is committed to ensuring that all its information sharing activities comply with applicable laws, regulations, and policies, including those that pertain to privacy, confidentiality, and civil liberties.

Secret Service Framework

To protect our financial infrastructure, industry, and the American public, the Secret Service has adopted a multi-faceted approach to aggressively combat cyber and computer-related crimes.

Electronic Crimes Task Forces

In 1995, the Secret Service New York Field Office established the New York Electronic Crimes Task Force (ECTF) to combine the resources of academia, the private sector, and local, state and federal law enforcement agencies to combat computer-based threats to our financial payment systems and critical infrastructures. In 2001, Congress directed the Secret Service to establish a nationwide network of ECTFs to "prevent, detect, and investigate various forms of electronic crimes, including potential terrorist attacks against critical infrastructure and financial payment systems."[9]

Secret Service field offices currently operate 35 ECTFs, including two based overseas in Rome, Italy, and London, England. Membership in our ECTFs includes: over 4,000 private sector partners; over 2,500 international, federal, state and local law enforcement partners; and over 350 academic partners. By joining our ECTFs, our partners benefit from the resources, information, expertise and advanced research provided by our international network of members while focusing on issues with significant regional impact.

Cyber Intelligence Section

Another example of our partnership approach with private industry is our Cyber Intelligence Section (CIS) which analyzes evidence collected as a part of Secret Service investigations and disseminates information in support of Secret Service investigations worldwide and generates new investigative leads based upon its findings. CIS leverages technology and information obtained through private sector partnerships to monitor developing technologies and trends in the financial payments industry for information that may be used to enhance the Secret Service's capabilities to prevent and mitigate attacks against the financial and critical infrastructures. CIS also has an operational unit that investigates international cyber-criminals involved in cyber-intrusions, identity theft, credit card fraud, bank fraud, and other computer-related crimes. The information and coordination provided by CIS is a crucial element to successfully investigating, prosecuting, and dismantling international criminal organizations.

Electronic Crimes Special Agent Program

A central component of the Secret Service's cyber-crime investigations is its Electronic Crimes Special Agent Program (ECSAP), which is comprised of nearly 1,400 Secret Service special agents who have received at least one of three levels of computer crimes-related training.

Level I – Basic Investigation of Computers and Electronic Crimes (BICEP): The BICEP training program focuses on the investigation of electronic crimes and provides a brief overview of several aspects involved with electronic crimes investigations. This program provides Secret

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[9] *See* Public Law 107-56 Section 105 (appears as note following 18 U.S.C. § 3056).

Service agents and our state and local law enforcement partners with a basic understanding of computers and electronic crime investigations and is now part of our core curriculum for newly hired special agents.

<u>Level II – Network Intrusion Responder (ECSAP-NI):</u> ECSAP-NI training provides special agents with specialized training and equipment that allows them to respond to and investigate network intrusions. These may include intrusions into financial sector computer systems, corporate storage servers, or various other targeted platforms. The Level II trained agent will be able to identify critical artifacts that will allow for effective investigation of identity theft, malicious hacking, unauthorized access, and various other related electronic crimes.

<u>Level III – Computer Forensics (ECSAP-CF):</u> ECSAP-CF training provides special agents with specialized training and equipment that allows them to investigate and forensically obtain digital evidence to be utilized in the prosecution of various electronic crimes cases, as well as criminally-focused protective intelligence cases.

These agents are deployed in Secret Service field offices throughout the world and have received extensive training in forensic identification, as well as the preservation and retrieval of electronically stored evidence. ECSAP-trained agents are computer investigative specialists, qualified to conduct examinations on all types of electronic evidence. These special agents are equipped to investigate the continually evolving arena of electronic crimes and have proven invaluable in the successful prosecution of criminal groups involved in computer fraud, bank fraud, identity theft, access device fraud and various other electronic crimes targeting our financial institutions and private sector.

National Computer Forensics Institute

The National Computer Forensics Institute (NCFI), located in Hoover, AL, is the result of a partnership between the Secret Service, NPPD, the State of Alabama, and the Alabama District Attorney's Association. The goal of this facility is to provide a national standard of training for a variety of electronic crimes investigations. The program offers state and local law enforcement officers and prosecutors the training necessary to perform computer forensics examinations, respond to network intrusion incidents, and to conduct electronic crimes investigations, while judges receive general education in these areas. Since opening in 2008, the institute has held over 150 cyber and digital forensics courses in 16 separate subjects and trained and equipped more than 3,000 state and local officials, including more than 2,300 police investigators, 840 prosecutors, and 230 judges from all 50 states and three U.S. territories. These NCFI graduates represent more than 1,000 agencies nationwide.

State and local agencies greatly benefit from this Secret Service provided education on investigating cyber crime. In some of the advanced forensics and network intrusion courses, students are issued all of the hardware, software and licenses necessary to conduct investigations. NCFI students receive the same equipment and advanced software as US Secret Service special agents—a considerable benefit as it allows both the local officer and the federal agent to operate on common systems.

Graduates of the NCFI return to their respective agencies and apply their newly acquired skills and equipment to investigating computer-based crimes. Additionally, these graduates are offered the chance to participate in the Secret Service's Electronic Crimes Task Force (ECTF) program. State and local ECTF members work alongside other federal agencies and private sector entities to combat the systemic flood of cyber related crimes targeting both private citizens and our nation's financial infrastructure. These ECTF members also serve as force multiplier for the US Secret Service ECSAP program.

Partnerships with Academia

The Secret Service has a long history of closely partnering with academia as a part of our mission. For example, Drexel University is a valued member of our Philadelphia ECTF, and this highly productive partnership to address the challenges of cyber crime is an excellent example of the sort of partnerships the Secret Service has developed with over 200 academic institutions nationwide through our ECTFs. The Secret Service is continually expanding its partnerships with academia through its 35 Electronic Crimes Task Forces. In addition to the numerous universities that are ECTF members, the Secret Service has a close, collaborative relationship with both Carnegie Mellon and the University of Tulsa.

In August 2000, the Secret Service and Carnegie Mellon University Software Engineering Institute (SEI) established the Secret Service CERT[10] Liaison Program to provide technical support, opportunities for research and development, as well as public outreach and education to more than 150 scientists and researchers in the fields of computer and network security, malware analysis, forensic development, training and education. Supplementing this effort is research into emerging technologies being used by cyber-criminals and development of technologies and techniques to combat them.

The primary goals of the program are: to broaden the Secret Service's knowledge of software engineering and networked systems security; to expand and strengthen partnerships and relationships with the technical and academic communities; partner with CERT-SEI and Carnegie Mellon University to support research and development to improve the security of cyberspace and improve the ability of law enforcement to investigate crimes in a digital age; and to present the results of this partnership at the quarterly meetings of our ECTFs.

In August 2004, the Secret Service partnered with CERT-SEI to publish the first "Insider Threat Study" examining the illicit cyber activity and insider fraud in the banking and finance sector. Due to the overwhelming response to this initial study, the Secret Service and CERT-SEI, in partnership with DHS Science & Technology (S&T), updated the study and released the most recent version just last year, which is published at http://www.cert.org/insider_threat/.

To improve law enforcement's ability to investigate crimes involving mobile devices, the Secret Service opened the Cell Phone Forensic Facility at the University of Tulsa in 2008. This facility has a three-pronged mission: (1) training federal, state and local law enforcement agents in embedded device forensics; (2) developing novel hardware and software solutions for extracting

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[10] CERT—not an acronym—conducts empirical research and analysis to develop and transition socio-technical solutions to combat insider cyber threats.

and analyzing digital evidence from embedded devices; and (3) applying the hardware and software solutions to support criminal investigations conducted by the Secret Service and its partner agencies. To date, investigators trained at the Cell Phone Forensic Facility have completed more than 6,500 examinations on cell phone and embedded devices nationwide. Secret Service agents assigned to the Tulsa facility have contributed to over 300 complex cases that have required the development of sophisticated techniques and tools to extract critical evidence.

These collaborations with academia, among others, have produced valuable innovations that have helped strengthen the cyber ecosystem and improved law enforcement's ability to investigate cyber crime. The Secret Service will continue to partner closely with academia and DHS S&T, particularly the Cyber Forensics Working Group, to support research and development of innovative tools and methods to support criminal investigations.

Legislative Action to Combat Data Breaches

While there is no single solution to prevent data breaches of U.S. customer information, legislative action could help to improve the Nation's cybersecurity, reduce regulatory costs on U.S. companies, and strengthen law enforcement's ability to conduct effective investigations. The Administration previously proposed law enforcement provisions related to computer security through a letter from OMB Director Lew to Congress on May 12, 2011, highlighting the importance of additional tools to combat emerging criminal practices. We continue to support changes like these that will keep pace with rapidly-evolving use of information technology and associated cybersecurity risks.

Conclusion

The Secret Service is committed to safeguarding the Nation's financial payment systems by investigating and dismantling criminal organizations involved in cyber crime. Responding to the growth in these types of crimes and the level of sophistication these criminals employ requires significant resources and greater collaboration among law enforcement and its public and private sector partners. Accordingly, the Secret Service dedicates significant resources to improving investigative techniques, providing training for law enforcement partners, and raising public awareness. The Secret Service will continue to be innovative in its approach to cyber crime and cyber security and is pleased that the Subcommittee recognizes the magnitude of these issues, the evolving nature of these crimes, and the importance of academic institutions, like Drexel University, in addressing these issues.